Information and Facilitation Interventions for Accountability in Health and Nutrition: Evidence from a Randomized Trial in India*

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Abstract

Community-based accountability interventions have shown potential to improve delivery of public services, but there is limited evidence on the effectiveness of such interventions when implemented at scale by developing country governments. We study the effectiveness of social accountability interventions implemented by the Indian state government of Uttar Pradesh aimed at improving delivery of primary health and nutrition services to children and pregnant women. Using a village-level randomized trial design, we investigate two key mechanisms through which accountability interventions are hypothesized to improve healthcare delivery and health outcomes: information provision about health service entitlements and facilitation of collective action for community monitoring. We find large improvements in immunization rates, treatment of childhood diarrhea, and institutional delivery rates, modest improvements in child nutritional outcomes, and no effects on child mortality. Overall, the effects of information combined with facilitation are larger and statistically significant more often than that of providing information alone. We also find evidence of gender disparities with most of the average effects being driven by improvements among boys, with little to no effect of accountability interventions among girls.

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Key words: Accountability, Community, Information, Facilitation, Monitoring, Health

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1 INTRODUCTION

Public service delivery in many parts of the developing world is constrained by problems of low accountability and low performance (World Bank 2003). This is particularly severe in the health sector, where the inability of existing administrative mechanisms to monitor provider performance has led to accountability problems ranging from widespread absenteeism and low quality of care to gross negligence by service providers (Chaudhury, Hammer, Kremer, et al. 2006, Das, Hammer and Leonard 2008, Das, Holla, Das, et al. 2012, Das, Holla, Mohpal, et al. 2016, Mohanan, Vera-Hernandez, Das, et al. 2015). Faced with these challenges, governments, donors, and advocacy groups have turned their attention towards community-driven models of development that rely on greater citizen engagement to hold service providers accountable and improve service delivery (Mansuri and Rao 2004, Molina, Carella, Pacheco, et al. 2017, World Bank 2016).

These models of community-based accountability – sometimes referred to as community-driven development, community monitoring, participatory development, and social accountability – are based on the premise that citizens can be instrumental in enhancing the accountability of public officials, reducing leakage of funds, and ultimately improving service delivery (Ringold, Holla, Koziol, et al. 2012, Rosato, Laverack, Grabman, et al. 2008). Social accountability interventions typically seek to do this by (a) providing information to community members on services they are entitled to receive; and (b) facilitating citizen engagement with service providers and local officials through community meetings where grievances with service providers or officials might be redressed publicly (Ringold, Holla, Koziol, et al. 2012). Social accountability interventions could potentially have large effects on improving service delivery depending on the underlying market failures that contribute to low levels of provider performance. The failure could be one of information, with citizens being unaware of their entitled benefits or recognizing that the

problems faced by them individually are common to other community members. Under such circumstances, social accountability interventions can give citizens new information based on which they can monitor providers or hold them accountable to deliver adequate services. Alternatively, if lack of accountability is attributable to coordination failures, where community members fail to participate in collective action or social factors discourage community members from demanding their entitled benefits, such interventions could facilitate community meetings that bring together community members and providers as a solution to such failures.

In this paper, we study the effectiveness of accountability interventions on service delivery for health and nutrition in India using a village-level cluster randomized trial design. We focus on the two key mechanisms through which social accountability interventions could impact service delivery by estimating the impact of providing information alone relative to the effect of providing information combined with facilitation for community meetings. We conduct our study in a setting where the accountability interventions were developed and implemented by the government of Uttar Pradesh (UP), India's largest state with a population of over 200 million and poor health and economic indicators.

Our paper contributes to a growing literature on the role of information provision and community monitoring to improve public service delivery in developing countries. Many papers in this broader literature have focused on efforts in education, infrastructure, or food delivery (Andrabi, Das and Khwaja 2017, Banerjee, Banerji, Duflo, et al. 2010, Benjamin A. Olken 2007, Pandey, Goyal and Sundararaman 2009, Pradhan, Suryadarma, Beatty, et al. 2014). Overall, the literature finds mixed effects of monitoring and information on public service delivery.[1]

[1] Our paper also relates to a broader literature on the effects of information, monitoring and penalties (Boning et al., 2018; Gray and Shimshack, 2011; Hansen, 2015; Pomeranz, 2015), especially in the context of difficult monitoring and enforcement (Jin and Leslie, 2003; Reinikka and Svensson, 2005; Alm et al., 2009; Shimeles et al., 2017; Kollmuss and Agyeman, 2002).

The literature also includes a small but growing number of studies that evaluate the effects of social accountability interventions on health service delivery and health outcomes specifically. Early evidence from Uganda has been promising. Björkman and Svensson (2009) randomized 50 public sector dispensaries and their catchment areas to receive information about health outcomes along with facilitated meetings with local service providers . This study found large reductions in under-5 mortality rates, increases in weight of infants, and utilization of health services, but it did not assess whether the effects were driven by information provision alone or by information and participation in community meetings. In subsequent work in the same study areas, Bjorkman, De Walque, and Svensson (2017) estimated the effect of information and participation relative to conducting meetings without providing information. The authors found that participation in community monitoring meetings had no effect relative to information combined with facilitation and concluded that the impact of social accountability is driven by information provision. One limitation in this approach is that information might be a necessary condition to implement successful community meetings and the marginal effect of facilitation in addition to information remains unknown.

Another limitation of early studies of social accountability stems from their implementation in a controlled setting by the research team and local NGOs, which may have contributed to well-implemented interventions. While this is certainly not unusual, estimates of program impact when implemented with minimal deviations from design can be closer to the efficacy of the intervention, rather than effectiveness of the program. The same program of interventions, when implemented by governments in developing countries or at scale, often face problems of weak adherence to intervention design. The difference between efficacy and effectiveness in such settings can be quite large. Indeed, Raffler, Posner and Parkerson (2019) do not find evidence of large improvements

on mortality outcomes or utilization when the information and facilitation interventions from the study in Uganda were implemented on a large scale (the ACT Health study); but they find evidence of modest effects on treatment quality and patient satisfaction.[2] In another large study (hereafter the T4D study), Arkedis, Creighton, Dixit, et al. (2019) experimentally tested the effect of community-led, non-prescriptive, transparency and accountability interventions in Indonesia and Tanzania in 100 communities. Overall, the interventions had no significant impact on maternal health, newborn health, and measures of civic participation. The apparent lack of impact was attributed to the inability of communities to independently figure out solutions and plan actions to achieve improvements in quality of care. The (largely) null findings from both the Raffler et al and the Arkedis et al papers are in contrast to another recent study in Sierra Leone (Darin Christensen, Dube, Haushofer, et al. 2020). Prior to the Ebola crisis, the research team had introduced community monitoring programs that included local health care provision score cards and three coordinated meetings between community and healthcare workers that led to large improvements in careseeking and treatment of Ebola. Taken together, beyond the obvious challenges of drawing global inferences from programs randomized in specific countries, these studies point to the importance of providing locally contextual information and to the role of facilitated meetings that help communities address grievances and monitor healthworker performance.

Our paper makes two key contributes to this growing literature on community-based accountability interventions. First, we test the impact of providing information only relative to providing information in addition to facilitation of community participation for accountability. We

[2] There are several notable differences in design between the two studies, in addition to the issue of scale. While P2P was implemented by a small group of selected local NGOs with prior experience, ACT Health was implemented by a large consortium with implementing partners who had no prior local experience. P2P organized 2 half-day community meetings, while ACT held one such meeting in each community. The average participation in ACT Health meetings was half as much as P2P. Finally, the data collection was conducted by implementing community organizations in P2P, while ACT Health relied on enumerators from the research institution (IPA).

do so in a 3-arm cluster randomized trial in 120 villages in UP. Among the 120 villages, 40 were randomly selected to receive information about health outcomes and health service entitlements related to maternal and child health (information only arm) while another 40 villages recived the identical information as well as facilitation of monthly meetings by designated individuals from a UP government agency (information plus facilitation arm). No accountability interventions were implemented in the remaining 40 villages. Both of the intervention arms represent potential policy interventions that governments aiming to improve public service delivery may be able to implement, with information provision alone being a lower-cost approach than information provision and facilitation. Second, our study assesses the effectiveness of accountability interventions as they are implemented by government agencies in resource-constrained settings. We leveraged a major Social Accountability (SA)[3] initiative of the UP government and partnered with the government to test the effectiveness of the intervention's components in 120 villages in parallel with wider implementation of the initiative in the rest of the state.

We find that both information provision as well as the combined information provision and faciliation of community monitoring over a 12-month period had large and statistically significant impacts on healthcare utilization and on child and maternal health outcomes. Overall, as seen in Figure 1, the improvements are marginally larger and more often statistically significant in the information plus facilitation arm. Although some of these effects are imprecisely estimated, the key malnutrition outcomes of stunting and underweight among children aged ≤5 years were reduced by approximately 3-4 percentage points in both arms while immunization rates increased by almost 13 percentage points in the information plus facilitation arm. We do not observe any

[3] We use the SA abbreviation to refer to the specific Social Accountability component of the UPHSSP program, details of which are described in section 2.1. Elsewhere when we refer to social accountability as a mechanism, we do not use capitalization or the acronym.

effects on child mortality. The interventions also led to significant improvements in institutional delivery rates and we observe evidence of better access to family planning services, as indicated by reductions in proportions of households that had a child born in past year in both intervention arms, with larger reductions of 5.6 percentage points in the information plus facilitation arm. For robustness we compare all of our experimental estimates from the follow-up data to estimates from a difference-in-difference analysis using baseline data collected by the government prior and find that results from the two approaches are indistinguishable. Our investigation of treatment heterogeneity shows evidence of gender disparities: much of the improvements (average treatment effects) on child health seen are driven by improvements among boys, with little to no effect of accountability interventions among girls. We do not find any evidence of heterogeneity in treatment effects by caste.

In the following section, we describe the context of the Social Accountability (SA) initiative in UP. Section 3 presents our experimental design, data, and empirical strategy including details of the study interventions. We describe results in section 4 and conclude with a discussion of our findings in section 5.

2 BACKGROUND

In 2017, over one in five children globally under the age of five were stunted.[4] Although poverty is an obvious contributor to malnutrition, dramatic reductions in extreme poverty rates globally over the last several decades have not led to similar reductions in stunting in children under five years of age. In India, which has witnesed significant economic growth and poverty reduction, the prevalence of stunting in children remains extremely high in parts of the country (Bhutta 2016,

[4] Stunting is defined as height-for-age Z-scores less than two standard deviations below the WHO child growth standard median.

Pathak and Singh 2011, Wang, Kane, Xu, et al. 2013). India accounts for almost 40% of the world's stunted children and has dramatic variation among its 640 districts with stunting prevalence ranging from 12.4% to 65.1% (Menon, Headey, Avula, et al. 2018). Among children in our study areas in UP, nearly half of all children aged ≤5 years were stunted and about 20% were wasted.

Failures in public service delivery is an important reason for high child malnutrition and mortality outcomes in many low-income countries and especially in India. Previous studies have documented poor quality of health services delivered in rural areas where there are relatively few alternative options for patients to receive healthcare (Das and Hammer 2005, Das and Hammer 2014, Das, Holla, Das, et al. 2012, Mohanan, Babiarz, Goldhaber-Fiebert, et al. 2016, Mohanan, Vera-Hernandez, Das, et al. 2015). There are widespread problems of absenteeism in the public sector and quality of care provided both in public and private sector is very low even when providers are available (Chaudhury, Hammer, Kremer, et al. 2006, Das, Holla, Mohpal, et al. 2016, Muralidharan, Chaudhury, Hammer, et al. 2011, Singh 2015).

One of the factors driving poor quality of public service delivery, particularly in health, is the low level of accountability of public providers towards the communities they serve (World Bank 2003). In the public health sector in India in particular, administrative accountability of providers is weak. Absenteeism in public health clinics was as high as 40%, and providers are rarely sanctioned for such behavior. Providers are posted to desirable postings in the health sector in exchange for side payments, further enabling a system of low accountability and even documented instances of negligence (La Forgia, Raha, Shaik, et al. 2015).

2.1 Social Accountability in Uttar Pradesh

UP is India's most populous state (over 200 million people) and about 85 percent of its population is rural. With a poverty rate of 30 percent, UP has among the worst health and nutrition indicators in India, and even globally.[5] The Government of Uttar Pradesh, as part of the World Bank-funded Uttar Pradesh Health Systems Strengthening Project (UPHSSP), implemented a set of initiatives aimed at improving accountability in delivery of health and nutrition services. The UPHSSP included a component that focused on the development and implementation of social accountability interventions that would strengthen the delivery of health and nutrition services by frontline health workers. The project aimed to build on efforts of other health sector projects in the state that introduced programs such as citizens' charters and community-based accountability initiatives to improve performance of frontline health workers. By focusing on delivery of services provided by these individuals and on the management of community resources, the UPHSSP project aimed to improve key nutrition and health outcomes in the state.

2.2 Frontline Health Workers

In UP, as in most parts of India, primary health and nutrition services are delivered by three key frontline health workers: the Accredited Social Health Activist (ASHA), the Auxiliary Nurse Midwife (ANM), and the Anganwadi Worker (AWW). The ASHA is typically a female resident of the village who is recruited and trained to deliver health information and help community members access health services. ASHAs are tasked with creating awareness about health and disseminating information about publicly provided health services. The ANM provides primary care in the community, including maternal and child health services, family planning, immunizations, and treatments of minor conditions such as childhood diarrhea and respiratory

[5] The under five mortality rate in Uttar Pradesh in 2015, around the time when this study was conducted, was 61.15 compared to India's national average of 47.81 per 1000 live births. Liu, Chu, Oza, et al. (2019)

illnesses. The ANM also trains and guides the ASHA, and supervises the organization of monthly Village Health and Nutrition Days (VHNDs) in the village when immunizations and other nutrition and primary care services are offered. The AWW is a community-level health worker who manages the village-level child development centers that provide day-care facilities with a mid-day meal for pre-school aged children in the village. As part of India's Integrated Child Development Scheme (ICDS), the AWW is responsible for monitoring child growth, tracking malnourished children, providing health and nutrition education, and dispensing supplementary nutrition packages. Although the ASHA, ANM, and AWW are employed by different Government departments[6], they function as a team to jointly serve the health and nutritional needs of the village.

2.3 Village Health, Sanitation, and Nutrition Committees (VHSNCs)

The UP government's social accountability initiative was developed to leverage community participation in a manner that was scalable and sustainable. As such, interventions were targeted at Village Health, Sanitation, and Nutrition Committees (VHSNCs), the local public health body at the level of the Gram Panchayat (GP), the smallest unit of local self-government in India usually comprising a few villages. The VHSNCs were constituted under India's National (Rural) Health Mission to enable citizens to publicly raise concerns and address local problems relating to health, sanitation, and nutrition (Government of India 2013). VHSNC meetings are intended to be open to the public, providing an inclusive forum for villagers from all backgrounds to voice complaints and concerns about health service delivery to local officials while also providing input on how to spend funds allocated to each GP. The VHSNC membership typically includes elected members of the village government (Panchayat), the frontline health workers (ASHA, ANM, and AWW),

[6] The ANM is recruited by the Department of Health and Family Welfare, while the ASHA is selected and recruited by the community. The AWW is recruited by the Department of Women and Child Development that runs the ICDS program.

as well as members of the community. As per guidelines of the Government of India, the VHSNC is responsible for creating awareness about nutrition, assess nutritional deficiencies in the village, monitor and supervise the Aanganwadi center and ensure that the monthly VHND is organized. In addition, the VHSNC also makes decisions on how flexible funds provided annually by the Government to each village can be used for health and nutrition priorities identified by the committee.

2.4 SA Component in UP Health Systems Strengthening Project

As part of the UPHSSP, the SA interventions in UP were designed by the government in 2015 with technical inputs from our team as part of overall World Bank support. Implementation of the interventions began in May 2016. In order to ensure scalable and sustainable implementation in the future[7], the interventions were implemented by UP's Deendayal Upadhyay State Institute for Rural Development (SIRD), a seperate government agency that focuses on implementation of rural development programs in the state (all Indian states an SIRD to support rural development programs). SIRD is the main training institute for the state's human resource needs for rural development with large infrastructure for training and logistics across UP.[8] SIRD implemented the SA interventions in 10 districts selected by the UP government, covering a population of almost 27 million. The UPHSSP and SIRD-led SA interventions included both information provision as well as facilitation – the two channels through which accountability interventions are expected to improve service delivery and health outcomes.

[7] This design feature aimed to address a common critique of development interventions that are implemented at small scale by project-specific teams and appear to have strong results but then fail to live up to expectations when implemented by government agencies.

[8] The SIRD also has a long history of undertaking projects in rural development such as efforts to improve knowledge of rights and responsibilities in villages of UP and information campaigns around water irrigation projects. For more details please visit http://www.sirdup.in/

2.4.1 Information component in the UPHSSP-SIRD implementation:

The SA interventions were implemented by a team of 300 Gram Panchayat Coordinators (GPCs) who were recruited, trained, and deployed by SIRD. The first responsibility for the coordinator assigned to a GP was to activate the local VHSNC by visiting the elected head of village (*sarpanch)*, looking up names of VHSNC members in the panchayat registers and then meeting each member individually.[9] The GPC informed the member that s/he was in fact listed as a member of the VHSNC, explained what the roles and responsibilities of the VHSNC were, and also informed them about the upcoming VHSNC meeting date (suggested by the head of village). While locating the VHSNC members in the village, the GPC also reminded members of the community about the upcoming meeting.

2.4.2 Facilitation in the UPHSSP-SIRD implementation

In addition to activating the VHSNC, the two main facilitation responsibilities of the GPC were to help set an agenda for each meeting with advice from VHSNC and community members, and help facilitate participation by reminding everyone of the time and venue of the meeting. GPCs were instructed that they were not responsible for conducting the meeting or resolving disputes or debates that might come up. Second, the GPC was required to document an "action taken report" to help the VHSNC revisit past discussions and check on progress made since the last meeting.
In addition to training and deploying the GPCs, SIRD also conducted a large-scale training program for all VHSNC members to train them on the roles and responsibilities of the VHSNC, their financial obligations as well as possible ways in which they could either resolve concerns raised in the meeting or escalate them to higher authorities in the health department.

[9] A key challenge in the development and implementation of social accountability through VHSNCs in UP was that very few VHSNCs in the state were operational. Although these committees existed on paper, in practice almost none of them had ever convened a meeting and most members of the committee were not aware of being included on such a committee or what the roles and responsibilities of the committee were.

The social accountability interventions that we study in this paper include the information intervention and the GPC-led facilitation intervention. In order to project the full set of costs incurred, we include the cost of project administration as part of state's budgets for the SA intervention, costs of investigators and analysts working on information interventions as well as costs of information interventions that were implemented in conjunction with surveys. We estimate that the cost of providing information alone in an intervention village was USD1,750 over the course of the study period while the additional cost facilitation was USD2,750 per village.[10]

3 EXPERIMENTAL DESIGN, DATA, AND EMPIRICAL STRATEGY

Our study aimed to test the effectiveness of providing information alone, relative to information plus facilitation by GPCs. In order to do so, we augmented the SA implementation by UPHSSP and SIRD to introduce the accountability interventions in selected villages as part of a cluster randomized trial in two additional districts in UP where the government was supported by a third-party organization that provided (a) additional support to GPCs to ensure that facilitated meetings were held on a monthly basis, and (b) disemminated more detailed information on health outcomes and VHSNC meetings to all households in the villages. This section describes our randomized trial design, the SA interventions that were implemented in a random sample of villages, as well as the

[10] The information intervention was implemented by a private firm contracted for information dissemination activity at a cost of approximately $60,000. In addition, baseline data collection (prorated based on number of villages surveyed relative to those in information only arm) and analysis cost approximately $80,000, bringing the total cost of providing information in 80 villages to just over $140,000. The facilitation interventions by GPCs in the 40 villages in the information plus facilitation arm were implemented by the state government as part of a larger health systems reform project in 10 districts. The total budget of the government run program for social accountability was approximately $6 million; the program was implemented in half the administrative blocks in 10 districts, covering roughly 300 gram panchayats. The average cost of the government run GPC-facilitation intervention was $2000 per GP. With 40 GPs in our study arm, we project the total cost of facilitation to be approximately $80,000. The additional hand holding to ensure higher fidelity of implementation was conducted at a cost of approximately $30,000, bringing the total cost of the facilitation intervention in 40 villages to approximately $110,000.

data and empirical strategy used to determine causal effects of social accountability interventions on health outcomes and health service delivery.[11]

3.1 Baseline data collection and randomization

The study took place in 120 GPs in the UP districts of Fatehpur and Sultanpur. Of the 1,642 GPs in these districts, 60 were selected in each district using probabilities proportion to population size. In early 2015, the UPHSSP conducted a baseline household survey among 2,400 households in the 120 GPs. The survey assessed household characteristics, maternal and child health outcomes as well as awareness of roles and responsibilities of local health providers. Because GPs typically comprised 2-3 villages, one village in each GP was randomly selected for baseline data collection. In each selected village, 20 households were randomly selected following a household listing that identified a sampling frame of households that had any children under five years of age. Respondents in surveyed households were also asked specifically about the performance of frontline health workers in their communities (ASHAs, AWWs, and ANMs).

Using the baseline data, we generated matched trios of villages based on village-level indicators such as child nutrition status, awareness of roles and responsibilities of local healthcare providers, satisfaction with performance of healthcare providers, and demographic characteristics of households.[12] Within each trio, villages were then randomly assigned to one of the three study arms in a 1:1:1 ratio: a control arm in which no additional interventions took place, an 'information

[11] Our study design and analysis plan was also registered in the AEA Registry for randomized control trials under trial number AEARCTR-0001393.

[12] Following Imai, King and Nall (2009), King, Gakidou, Ravishankar, et al. (2007) we implemented the matched randomization design to allow for the possibility of political intervention that might lead to deviations from planned implementation of SA interventions in the 120 GPs. Although there were no such interventions from government, our empirical analysis accounts for the matched trio design by incorporating trio fixed effects. The experimental results in our paper are robust to the exclusion of trio fixed effects.

only' arm, and an 'information plus facilitation' arm. Table 1 shows that villages in the 3 arms are balanced across a range of baseline characteristics, as expected given the matched trio design.

3.2 Study Interventions

The interventions in our study build upon the SA program implemented by the UPHSSP-SIRD to disentangle the effects of the two components of social accountability interventions.

3.2.1 Information provision (in 80 villages)

Beginning in the third quarter of 2016, roughly one year after completion of baseline surveys, all households in the 80 intervention villages received information about the health status of children in their village as well as the roles and responsibilities of VHSNCs and healthcare providers. This information was presented to households during door-to-door visits. Households also learned about the policy introduced by India's National Health Mission in 2005 (and further strengthened in 2013) that GPs should have VHSNCs consisting of elected members of local government, frontline health workers, and some community members. Households learned about untied funds of 10,000 INR (approximately $160) that are allocated to villages annually for meeting community health and sanitation priorities. In addition, households also received information from 2015 baseline surveys on receipt of nutritional supplementation in their village, proportion of children underweight and stunted, and proportion of children immunized. Building on research from information diffusion in education (Andrabi, Das and Khwaja 2017), we provided both information about levels of outcomes and performance *relative to* district averages. After the initial visit, households also received reminders about upcoming meetings through automated phone calls and visits over the following four months.

3.2.2 Facilitation of meetings to promote community monitoring (in 40 villages)

In the 40 villages assigned to the 'information plus facilitation' arm, households received the same information interventions described in the previous sub-section. In addition, these 40 villages also received the UPHSSP-SIRD led implementation of SA through 16 government-appointed GPCs. As a result of the randomized sampling of villages, variations in geographic spread led to GPCs being assigned an average of 2-3 villages in the area. The GPCs served as facilitators who played a central role in implementing the SA interventions. At the outset, only 8 percent of villages had an existing VHSNC that met regularly and of which households were aware. More generally, VHSNCs tended to be inactive in much of UP even if they were more functional elsewhere in India (Kamble, Garg, Raut, et al. 2018, Srivastava, Gope, Nair, et al. 2016, Ved, Sheikh, George, et al. 2018). GPCs began their work by convening VHSNCs in villages where they were not functioning, a process of "activating" VHSNCs that served as a precursor to the community monitoring meetings.

The GPCs reviewed roles and responsibilities of VHSNCs with committee members and facilitated the organization of monthly meetings that were open to community members. This included community mobilization prior to meetings in order to promote attendance by community members. During the meetings, GPCs helped to organize discussion about topics relating to health outcomes in the villages and performance of the healthcare providers. Community members were encouraged to attend and discuss issues in the village related to health, sanitation, and nutrition. Meetings were to include the development of action plans to address grievances of community members and these were reviewed at subsequent monthly meetings. To ensure adherence to the protocol of monthly meetings, the government-led GPC intervention was augmented by appointing a UP-based research consulting firm to provide technical support to GPCs. The firm, appointed by

the World Bank, assisted the GPCs in formation and activation of VHSNCs, and provided information and oversight of GPC activities during monthly meetings. The GPC-led SA interventions and facilitation of VHSNC meetings took place for an intervention period of 12 months, until the end of the contract between UPHSSP and SIRD.

3.2.3 Follow-up data collection

To study the impacts of the social accountability interventions on health outcomes and health service delivery, we conducted follow-up surveys with 4,800 households in 120 villages during the last two quarters of 2018. These surveys occurred roughly 2 years after interventions were initiated, thereby allowing time to detect changes in child health outcomes as well as the performance of village-level healthcare providers. Following a listing of households in the 120 villages that contained at least one child aged ≤5 years (in order to focus on child health impacts of the interventions), 40 households were randomly selected in each village. Our analytical sample includes 5236 children under five years of age, from 4443 households.[13] Surveys measured demographic and socio-economic characteristics of households and individuals residing in the household. In addition, households reported on their awareness of the roles and responsibilities of key healthcare providers, engagement and satisfaction with those providers and the services they offer, as well as awareness of and engagement with VHSNCs. Households also reported on the incidence of diarrhea, care-seeking behavior for children with diarrhea, and vaccination uptake for

[13] The power calculations conducted at the time of proposal development suggested that a sample of 50 children under 5 years of age in each of the 120 clusters (a total sample size of 6000) and an ICC of 0.0175, would give 80% power to detect a 30% reduction in U-5 mortality, an effect size consistent with the results reported by studies in Uganda (Bjorkman & Svensson [2009]), Nepal, (Manandhar, Osrin et al., [2004]) and India (Tripathy, Nair et al., [2010]).

The minimum detectable effect size at 90% power for a sample size of 6000 is a 45% reduction in U-5 mortality. This target sample size also yields 80% power to detect a .19 SD change in anthropometric outcomes and 80% power to detect a 5 percentage point reduction in diarrhea incidence.

children aged ≤5 years. The height and weight of children aged ≤5 years were also measured as part of the household survey.

3.3 Empirical Strategy

The cluster randomized study design with villages being assigned to 'information only' and 'information plus facilitation' intervention arms provides the identification strategy for our empirical estimation of the effects on health service delivery, health-seeking behavior, and child health outcomes. We sought to assess whether information provision alone was sufficient to improve outcomes of interest and whether adding the facilitation of community meetings resulted in greater impacts on these outcomes.

We estimated the causal effects of the two social accountability interventions by estimating the following regression that compared outcomes at 2 years in intervention arms to the control arm:

$$Y_{ijd} = \alpha + \beta_1 * Information_{jd} + \beta_2 * (Info+facilitation)_{jd} + X_{ijd}\delta + \eta_d + \varepsilon_{ijd,}$$

with Y_{ijd} being the outcome of individual (or household) i in village j in district d, $Information_{jd}$ indicating whether village j in district d receiving information only, $Info+facilitation_{jd}$ indicating whether the village received information along with facilitation of community monitoring, X_{ijd} being a vector of individual- or household-specific variables, and η_d being district fixed effects. Coefficients β_1 and β_2 indicate the causal effects of the information only and information plus facilitation interventions, respectively, due to the random assignment of villages to these arms. In addition to this main specification, we also present results from analysis of the effects of these interventions from a difference-in-differences specification that incorporates data from the baseline survey conducted by the UP Government and the 2-year follow-up data.

The primary outcomes pertaining to children's health are anthropometric measures of height and weight. We hypothesized that improved household awareness of health outcomes and available services would affect healthcare seeking behavior for both prevention (such as immunization) and treatment. Similarly, community-based monitoring is expected to improve performance of frontline health workers, which would result in improved delivery of nutritional supplements and childhood vaccinations. Jointly, these interventions are expected to improve child health outcomes, with larger effects in the arm that combined both information and facilitation. The main health outcomes of interest were the prevalence of stunting (height-for-age Z-score < -2), underweight (weight-for-age Z-score < -2), and wasting (weight-for-height Z-score < -2) among children aged ≤5 years, mortality of children aged ≤5 years, vaccination coverage, and incidence of diarrheal diseases in the previous 2 weeks. In addition, we examined effects of the interventions on several measures of healthcare-seeking behavior (particularly antenatal care use and facility delivery rates), satisfaction with frontline health workers whose performance may have been influenced by SA interventions, and on birth rates that may have been affected by access to contraceptives.

4 RESULTS

4.1 Nutrition outcomes

Following the specifications in our pre-analysis plan, we first present results on nutritional outcomes among children aged ≤5 years in Table 2. We focus on outcomes of stunting, underweight, and wasting that were determined using height and weight measurements during data collected in the follow-up. The odd-numbered columns show the unadjusted effect of the interventions while even-numbered columns include the full set of household and child level

controls. The SA interventions reduced the probability of child malnutrition, especially stunting and underweight by almost equal magnitude (roughly 3-4 percentage points, relative to the control mean of 49.4% and 52.5%). However, this 8.3% reduction in prevalence of underweight with information and facilitation is not statistically significant after adjusting for multiple hypothesis testing (family wise p-values = 0.281 and 0.287 in columns 3 and 4 respectively). We do not observe any effect on the likelihood of wasting in either intervention arm.[14]

For continuous measures of nutritional status, particularly the Z-scores for height-for-age and weight-for-age, results are largely similar (see Appendix Table 1). The improvement in the height-for-age Z-score in the information plus facilitation arm was 0.14 with a standard error of 0.076 (t-statistic of 1.84), and the effect in the information only arm was smaller although not statistically significant (0.11, se = 0.08). The lack of precision on these estimates is not surprising, because our sample size had 80% power to detect a change of 0.19 SD in Z-scores. In order to look beyond the summary statistics, we also examine the impact of the interventions on the distribution of Z scores of height-for-age and weight-for-age non-parametrically in Appendix Figure 1. For both stunting and underweight, we observe a rightward shift in the distribution of Z scores for both the treatment arms, with a more visible shift in the density function in the information plus facilitation arm. The shift in distributions for both treatment arms are statistically significant, suggesting further evidence of improvements due to the accountability interventions.

[14] The pre-analysis plan mentions weight-for-height (related to wasting) as the main nutritional outcome of interest. However, this outcome is a marker of acute changes in nutritional status (when weight can respond before height). The stunting (height for age) and underweight (weight for age) capture changes in nutritional status over a longer period when both height and weight might respond independently. As a result, we report effects on all three nutritional outcomes.

4.2 Mortality

Another key health child health indicator we included in our pre-specified analyses was mortality among children aged ≤5 years. In Table 3, we examine differences between arms in total number of children aged ≤5 years who died in the past 5 years, a binary variable indicating whether there were any child deaths, as well as differences in deaths as a share of total births. There are no large or significant effects on mortality in either one of the specifications.[15] Previous studies of accountability interventions have found, at best, mixed effects on child mortality. The P2P study found large effects on under-5 mortality rates (Björkman and Svensson 2009, Donato and Garcia Mosqueira 2019), while the large-scale implementation of a similar program in the ACT Health study did not find comparable effects on mortality (Raffler, Posner and Parkerson 2019). We next focus attention on factors that could be important drivers of childhood health outcomes. In particular, we investigate the effect of the interventions on immunization rates, childhood diarrhea, and maternal healthcare-seeking behaviors.

4.3 Immunization

A key input into production of child health is immunization. In 2015-16 in Uttar Pradesh, almost half the children between ages of 12-23 months had not received their full dose of immunizations including BCG, Measles, and 3 doses each of DPT and Polio[16] (International Institute for Population Sciences 2015). Immunization is also part of the key health services delivered during monthly VHNDs.

[15] Data on child deaths in the past 5 years comes from all households interviewed in our sample. Since the sampling frame for our study – given the emphasis on nutrition outcomes – was restricted to all households that had at least one child under the age of five at the time of listing, we do not have data on child deaths among households that had no surviving children.

[16] BCG is the vaccine for TB, typically administered at birth along with first dose of Oral Polio Vaccine (OPV). DPT is vaccine for Diphtheria, Pertussis and Tetanus, administered at 6, 10, and 14 weeks in India.

We examine the effect of the accountability interventions in the two arms on children's completion of full immunization (BCG, measles, and 3 doses each for Polio and DPT) and individual component vaccines in Table 4. The analysis of full immunization, which was restricted to children aged 12-23 months, show that relative to 44% of children being fully immunized in the control arm, children in the information plus facilitation arm were 13 percentage points more likely to by fullly immunized. The increase in the information only arm was half as much (7 percentage points) and not precisely estimated. Columns 3-10 present estimates of the treatment effects on each of the component vaccines. Most of the effect on full immunization is driven by increases in coverage of DPT and Polio vaccines, for which coverage in the control arm was well below the coverage for measles and BCG vaccines. The share of children receiving 3 doses each of DPT increased by 12 percentage points in both treatment arms (relative to control mean of 74%), while share of children receiving all 3 doses of polio increased by 10 percentage points in the information plus facilitation arm, relative to 52% in the control. The increase in Polio vaccination in the information Only arm was half as much, and not statistically significant. The overall effect on immunization rate increases resulting from the accountability interventions is large, amounting to an almost 30% increase (from 43.9% to 56.6%) in the information plus facilitation arm.

4.4 Diarrhea

One of the aims of the accountability interventions was to improve delivery and utilization of primary health services including care for childhood illnesses such as diarrhea – a major killer of children in many parts of the developing world including UP. The prevalence of diarrhea in the preceding two weeks among children under five years of age in rural UP was 15.1% in 2015-16. (NFHS-4) In our sample of children of similar age, the prevalence of diarrhea was identical in the control arm. As Table 5 shows, there was no discernible effect of either treatment arm on the

prevalence of diarrhea. Since diarrhea incidence and prevalence is a function of sanitation and hygiene rather than delivery of health services, this is not surprising.[17] Conditional on having diarrhea, households in the information plus facilitation arm were 8.1 percentage points more likely to seek treatment for the sick child within 1 day of start of symptoms, although this estimate was just shy of conventional levels of statistical significance with an unadjusted p-value of 0.051. There were no effects on the duration of diarrhea illness, measured in number of days of symptoms conditional on having diarrhea.[18] Overall, our results on diarrhea suggest there were no large or significant changes in diarrhea prevalence or care-seeking behavior for diarrhea.

4.5 Maternal healthcare-seeking behaviors

Next, we investigate how the interventions affect healthcare seeking behavior among mothers. The accountability interventions were aimed at providers who were responsible for delivering antenatal care (ANC), nutritional supplementation, as well as support to pregnant and lactating mothers including assistance to facilitate the mothers delivering babies at healthcare facilities (instead of home) and family planning supplies. As Table 6 shows, neither of the intervention arms find a major effect on either the number of ANC visits or a binary indicator of ≥4 ANC visits. In contrast, rates of institutional delivery (columns 5-6), increased significantly in both intervention arms. The increase in the information plus facilitation arm was 6.8 percentage points relative to 80.6% in the control arm (6.5 percentage point increase in the information only arm). These increases, in addition to being statistically significant with family wise p-values of

[17] It is worth noting that the Government of India had been implementing, since 2017, a large national toilet construction program that was supposed to reduce open defecation – a major contributor to diarrhea. However, in practice, as reported by several studies, these newly constructed toilets were scarcely used and had largely failed to reduce open defecation practices.

[18] Time to diarrhea treatment is an important marker of how long the child is sick, given the high prevalence of diarrhea in these areas - almost 15 percent of children had diarrhea in past 2 weeks (International Institute for Population Sciences 2015). Longer episodes of diarrheal illness lead to dehydration and loss of nutrients, contributing to long term malnutrition. Also note that accounting for multiple hypothesis tesing further reduces the statistical significance

0.003, are notable given that facility-based delivery and care are considered the 'best bet' to bring down high rates of maternal mortality (Campbell and Graham 2006) especially in the context of Uttar Pradesh, a state with high maternal mortality.[19]

4.6 Satisfaction with frontline health workers

The accountability interventions provided information on the health status of children and on benefits and entitlements related to publicly provided health and nutrition services at the village level. Depending on pre-intervention levels of knowledge in a community as well as the extent to which there are changes in the quantity and quality of health service delivery, such information has the potential to lead to either higher or lower levels of satisfaction with service providers. We use information on households' self reported levels of satisfaction with each of the three frontline health workers. For each of the three types of providers, we create an index that averages various measures of satisfaction with provider performance. The results in Table 7 show that by and large, information provision led to reductions in satisfaction levels with frontline health workers. In the information only arms, reductions in satisfaction levels were observed for all providers, with large and significant reductions satisfaction with AWWs (the effect for ANM is not significant with family-wise p-values). The reductions in villages that received information and facilitation were smaller across the board, and not statistically significant in any of the specifications.

4.7 Effect on number of new births

Among the health services provided by ASHA and ANM for pregnant and lactating mothers and women of reproductive age, provision of counseling for family planning and contraception is a key component. This is especially pertinent since delivering the baby in a healthcare facility is

[19] Although India has met its maternal mortality ratio (MMR) targets for the Millenium Development Goals with a national average of 130 maternal deaths per 100,000 live births, MMR in Uttar Pradesh remains very high at 201 (CITE: http://www.censusindia.gov.in/vital_statistics/SRS_Bulletins/MMR%20Bulletin-2014-16.pdf).

accompanied by counseling on contraception and birth spacing. Improvements in service delivery for maternal health could thus affect fertility rates, especially in settings such as rural UP where fertility rates are among the highest in India.[20] Although we present findings from our analysis of effects of the accountability interventions on births over the study period in this section, we note that this outcome was not included in the pre-analysis plan.

To examine effects of the accountability interventions on births, we relied on birth history data from the door-to-door listing conducted to create a sampling frame for the follow-up survey. The listing included all households with ≥1 child aged ≤5 years. For the 13,327 households listed, we collected data on number of births, number of surviving children, and the timing of birth. We estimated effects of the intervention by using information on births that occurred in the year preceding data collection, the time period that provides an indication of changes in fertility behavior after the interventions were completed.

With data from households that report ≥1 surviving child at the time of listing, we expect a larger share of households would have had children in the past year relative to the reproductive age group in the general population. Indeed, 34.8 percent of households in the control arm reported having a child born in the past year. In Columns 1 and 2 in Table 8, we see that both treatment arms had significantly lower shares of households that reported any births. Households in the information only arm were 4.7 percentage points less likely to have a birth during the past year, while those in information plus facilitation arm were 5.6 percentage points less likely. The estimated effects represent 13 to 16 percent reduction in birth rates, relative to control, suggesting a large effect on reproductive behavior.[21]

[20] Total Fertility Rate (TFR) in 2013 in UP was 3.1, relative to India's national average of 2.3 (Government of India 2019).

[21] Data from provider surveys also show similar results on higher births reported in control areas. (See Appendix Table 2). Providers in information plus facilitation arms also reported higher numbers of contraception delivery in

One concern based on the data source for these results is that we might be overlooking differences in patterns of births and deaths across treatment and control arms among households that were not included in the listing (namely, households with no surviving children aged ≤5 years). To test whether our findings on births could be driven by this exclusion, we first check for any large differences in the rates of child survival across treatment arms that could raise concerns about differential selection into the listing dataset.[22] Columns 3 and 4 in Table 8 report estimates from regressions of a binary indicator of whether the child born in last year has survived on treatment arm assignment. The estimates are indistinguishable from zero. We also conducted a sensitivity analysis to test whether the observed patterns of reductions in reported births could possibly be driven by survey errors in capturing data on death rates. We find that it would require implausibly large rates of mortality that was also missed systematically from treatment arms, suggesting that the 4.7 and 5.6 percentage point reductions in proportion of households that had childbirths due to accountability interventions seen in Table 8 are likely not driven by errors in sampling.[23]

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previous 3 months (13.8 relative to 11.56 in control), fewer IFA tablets (suggestive of pregnant women, 23.2 relative to 28-29, in control and information only), and lower ANC registrations (indicative of new pregnancies in past 3 months, 26.5 relative to 29 in information only). However, because of small sample sizes (N=40 in each arm), we are constrained on power to test these differences.

[22] Another related concern is that observed fertility is endogenously determined by differences in child mortality (Schultz 1997, Wolpin 1997).

[23] We investigated whether results could be driven by unknown systematic errors in data collection due to which households with no surviving children were excluded in the treatment arms, but not in control arms. In Appendix Table 3, we consider the scale of such systematic omissions needed to explain the patterns observed in our data. We compute the range of child deaths that would need to be systematically missing in treatment arms. Panel A reports households that reported any or no births in the previous year across our full listing data of 13327 households. In Panel B, we estimate the implied infant mortality rate if the treatment areas had the same rates of households having births in past year, but all infant deaths were excluded in the houselisting process. In order to arrive at observed rates of births in our data, the treatment areas would have infant mortality rates of 188 and 227 per 1000 live births, which would be an implausibly large number even in the rural UP setting. For comparison, the IMR in rural UP in 2016 was 67, and the highest IMR reported globally in 2017 was 87.60 in Central African Republic and 81.7 in Sierra Leone (IGME 2017). In Panel C, we calculate what the implied birth rates might have been, if all households that had infant deaths at current levels of IMR in UP were systematically missed in the treatment arms. Under such a scenario, the differences in birth rates would have been smaller, but still large and significant. For instance, if *all* infant deaths were missed in the information plus faciliation arm, the proportion of households that had any births in the previous year would increase from 29.2% to 30.7%, relative to 34.8% in control arm. Overall, the sensitivity analyses suggest that the significant reductions of 4.7 and 5.6 percentage points in in proportion of households that had childbirths due to accountability interventions seen in Table 8 are likely not driven by errors in sampling.

4.8 Robustness Checks: Difference-in-differences estimates

The analysis in the preceeding sections relies on comparisons across the treatment arms using follow-up data that was collected two years after the introduction of the interventions. We also have access to baseline data that was collected from a smaller sample of households in the 120 villages in 2015, prior to introduction of the SA interventions. We do not rely on this data for our primary analysis due to concerns of quality of data that was collected by a vendor contracted by the government. Furthermore, the considerably smaller dataset that was collected at baseline (primarily for gathering health information that was used in the SA interventions) reduces precision of estimates at baseline relative to having a dataset of comparable size to the follow-up that the study team collected. Instead, we use this data from baseline to conduct a difference-in-difference analysis as proposed in our pre-analysis plan as a robustness check to compare with findings from the follow up data after experimental intervention.

We compare the key coefficients that we report in the main analysis in earlier sections with coefficients estimated using difference-in-differences. Figure 2 shows both sets of point estimates with their respective 95% confidence intervals - our estimates of the effect of the interventions from the follow up data are very similar to the point estimates from the difference-in-differences estimates. The full set of results estimated using difference-in-differences regression models are included in the appendix (Appendix Tables 4 to 8).

4.9 Heterogeneity in treatment effects

UP has vast gender disparities in health outcomes as well as in a wide range of health investments. The sex ratio at birth in UP, for instance, was 903 girls per 1000 boys in 2015-16 (International Institute for Population Sciences 2015). Similarly, the NHFS-4 also reports that the

proportion of girls fully vaccinated was lower than that among boys (48.7% and 53.2% respectively), and girls were taken to a health facility to receive treatment for diarrhea less often than boys (64% and 69% respectively). We focus on key health outcomes (nutrition) and health utilization (immunization and diarrhea treatment) for child health and institutional delivery rates for maternal health. Figure 3, Panel A shows the difference in treatment effects on improvements in nutritional outcomes by gender of the child. While the estimates have overlapping confidence intervals, we observe that much of the average treatment effects (improvements on stunting and underweight outcomes) reported in the main analyses are driven by improvements among boys. Panel B examines heterogeneity in effect of the interventions on immunization rates and diarrhea treatment; we do not observe patterns of gender differences on these two outcomes. In the bottom part of Panel B, we examine differences in the effect of interventions on institutional delivery rates based on gender of the child and find large differences. For instance, institutional delivery rates for boys are 8 percentage points higher (SE 0.031) in the information only arm, and 9.2 percentage points higher (SE 0.027) in the information plus facilitation arm, relative to control arm. Among girls, in contrast, the point estimates of the effect of interventions were 4.4 and 1.6 percentage points, with confidence intervals that include the null. This finding is particularly striking, because sex determination of the fetus is illegal in India. The large differences in rates of institutional delivery in our data are consistent with widespread evidence from India of son preference and lower parental investments on girls relative to boys (Barcellos, Carvalho and Lleras-Muney 2014, Bhalotra, Anukriti and Tam 2016, Bhalotra and Cochrane 2010, Jayachandran 2015, Jayachandran and Kuziemko 2011, Jayachandran and Pande 2017).

Finally, we also examine heterogeneity of treatment effects by caste. While we expect households from lower castes (particularly scheduled castes and scheduled tribes, SC/ST) to have

worse outcomes, it is possible that SA interventions in have smaller or larger effects among these groups. If households from higher castes are able to better use the information and resources, they might benefit more from SA interventions. On the other hand, is SA interventions improve the delivery of health services in general, it is possible that lower caste groups that previously had poor access to services and poor health outcomes would benefit the most. Figure 4 shows differences in heterogeneity in treatment effects by caste on the same set of outcomes in Panels A and B. We do not find evidence of consistently large or statistically significant differences in effects based on caste. The only exception is the top panel, where non-SC/ST households experience larger improvements in stunting outcomes in the information only arm, and the difference in stunting improvements is smaller in the information plus facilitation arm.

5 CONCLUSION

In this randomized trial of government-run social accountability interventions to improve health service delivery in low-income, rural areas within India's largest state, we find that information provision alone as well as the combination of information and facilitated community meetings lead to notable improvements in child health outcomes and healthcare-seeking behavior. While providing information about publicly funded entitlements and baseline health outcomes alone led to better outcomes, the bulk of our results suggest that combining this information provision with facilitated community meetings led to larger effects on key health outcomes. An important feature of this study is that the SA interventions tested were implemented by the government in a manner that was scaleable throughout the state of UP, which has the largest population in India. Of note, we find reductions in rates of stunting and underweight among young children along with large increases in rates of full immunization and rates of facility deliveries among pregnant women. With approximately 10% of UP's population being below the age of 4,

our estimates suggest that SA accountability interventions that increase full immunization rates by 13 percentage points could have a very large long-term effect on child development outcomes. Our findings add to the ongoing debate about effectiveness of information provision and community based efforts in development. Given that our study setting was one where the government implemented large scale accountability interventions based on deploying village-level facilitators to promote community based accountability, these findings are particularly noteworthy.

In light of recent papers finding mixed evidence of the effect of social accountability interventions when they are implemented at scale rather than in a more controlled environment, it is important to note that our results fall in the middle of the range of existing estimates of the effects of SA interventions. There were important improvements in children's nutritional status, immunization rates, and healthcare utilization by pregnant women, particularly when information provision was accompanied by facilitated community meetings that enabled community members to interact with public sector providers and local officials, thereby furthering accountability. However, some outcomes such as child mortaility, treatment for diarrhea, and satisfaction with key healthcare providers showed little to no improvement. While some previous studies have found large reductions in child mortality as a result of SA interventions, our study suggests that such large health impacts are unlikely when these interventions are implemented by governments in resource-limited settings. At the same time, there is encouraging evidence from our study that even in settings with low state capacity and limited budgets, SA interventions do nonetheless have meaningful impacts on maternal and child health outcomes. Accountability interventions might be more effective, however, with careful facilitation of community meeetings so that community members are able to better diagnose their own health system problems, figure out solutions, and plan appropriate corrective actions. Our study also suggests that facilitation that is provided by

credible local respresentatives with significant prior engagement might be more successful at creating effective community monitoring.

Two aspects of the larger social accountability initiative in UP are salient in the context of the political economy of implementing social accountability interventions. First, the state of UP is one of the most challenging settings to conduct development interventions, driven by its massive size as well as low government capacity in rural areas. Second, the facilitation interventions were developed and implemented by government run institutions which also meant that implementation deviated from plans and timelines on numerous occasions. The partnership between two institutions within the state government created a unique setting where there was a high level of institutional accountability and commitment. Such commitment can be hard to replicate or sustain despite strong engagement and use of evidence – indeed, at the time of writing this manuscript, the state government had not been able to secure the budget for plans to replicate and scale the accountability interventions despite evidence of large program impacts. Information, we find, is indeed quite powerful; and it can be even more impactful when combined with appropriately designed and integrated facilitation mechanisms to empower communities.

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Figure 1. Impact of Information only and Information plus facilitation interventions on main outcomes

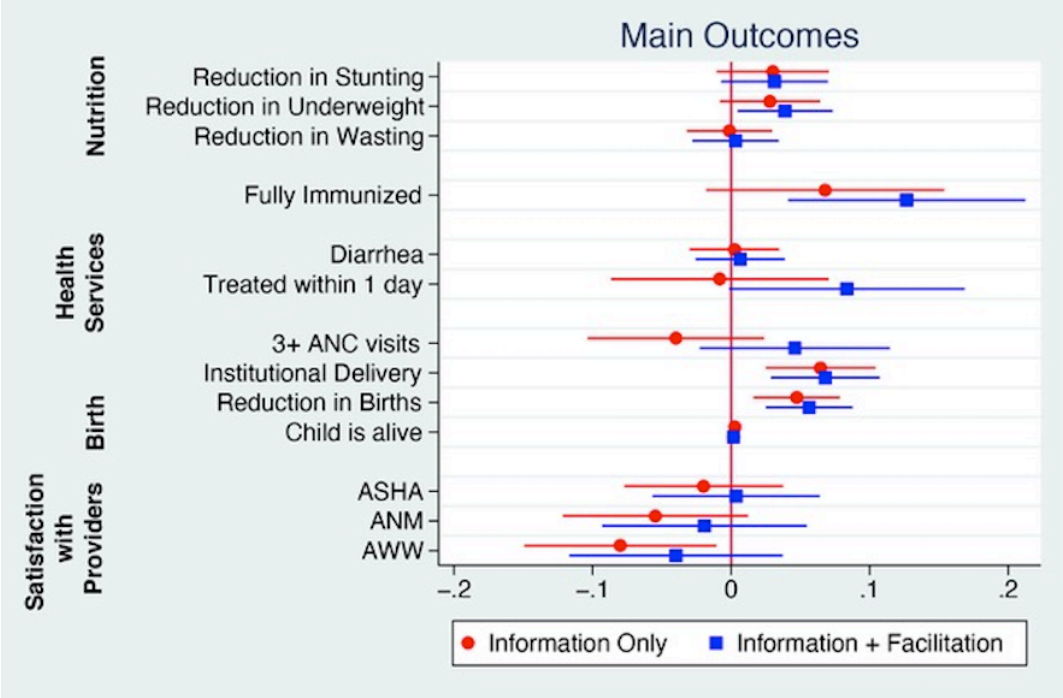


Figure 2. Panel A: Comparison of estimates from post-intervention data from randomized experiment with estimates from difference-in-difference specifications on nutrition

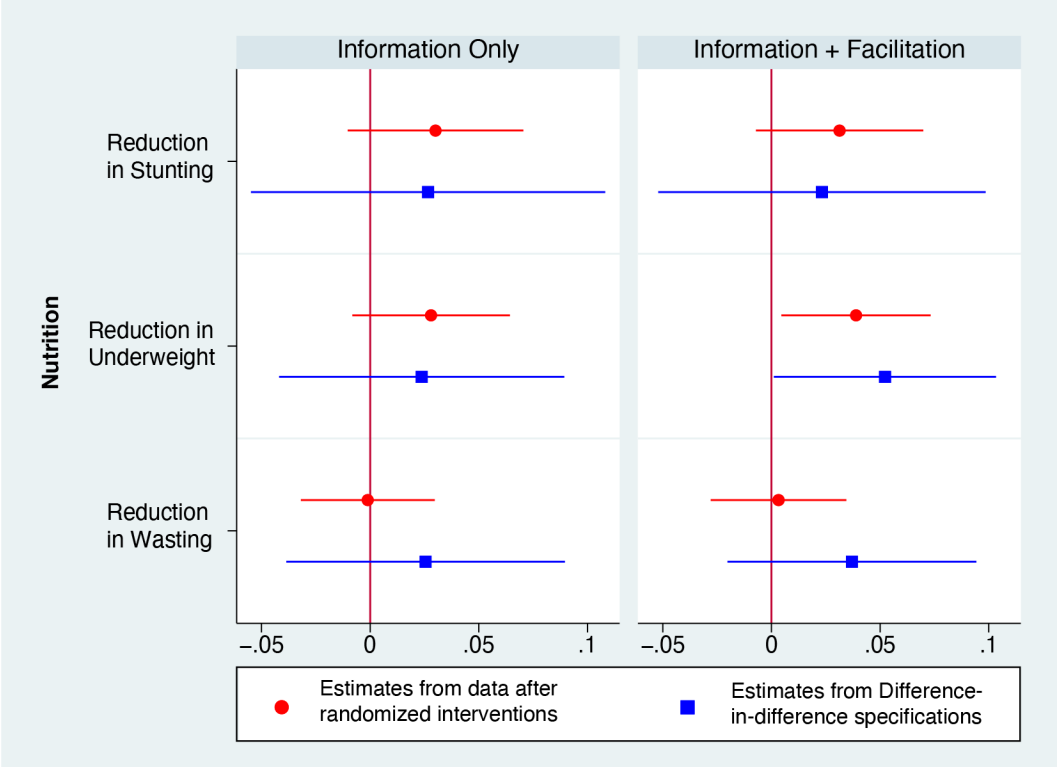


Figure 2. Panel B: Comparison of estimates from post-intervention data from randomized experiment with estimates from difference-in-difference specifications on health services

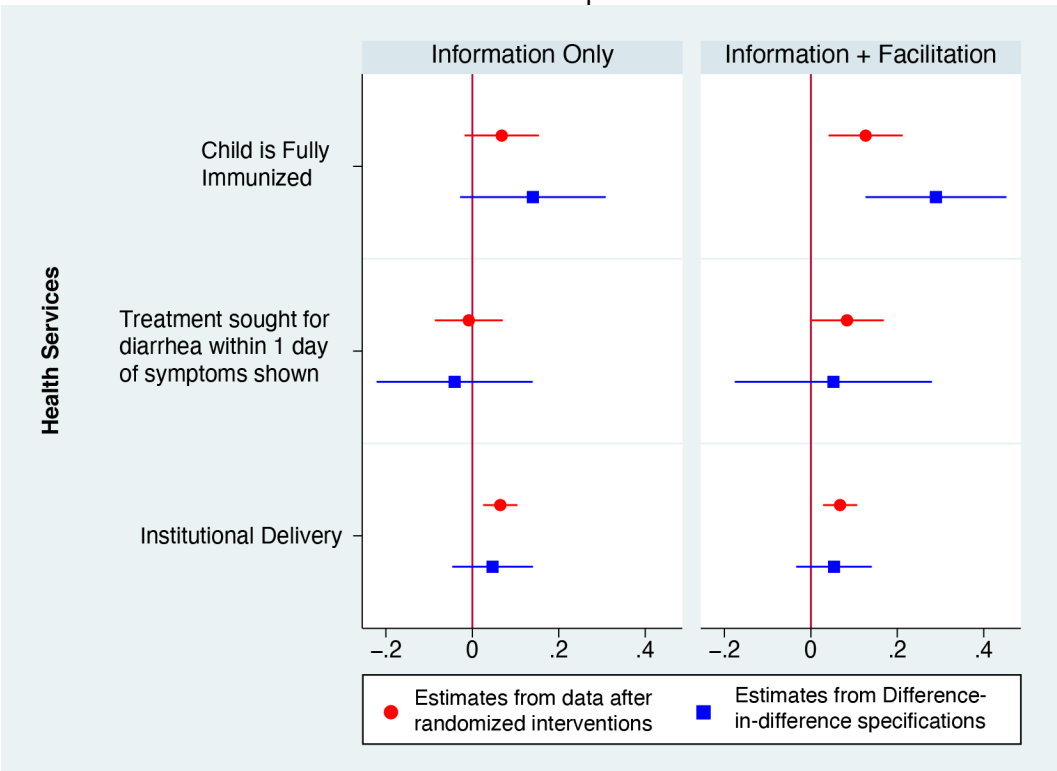


Figure 3.A. Effects of Accountability Interventions on Stunting, Underweight, and wasting, by gender.

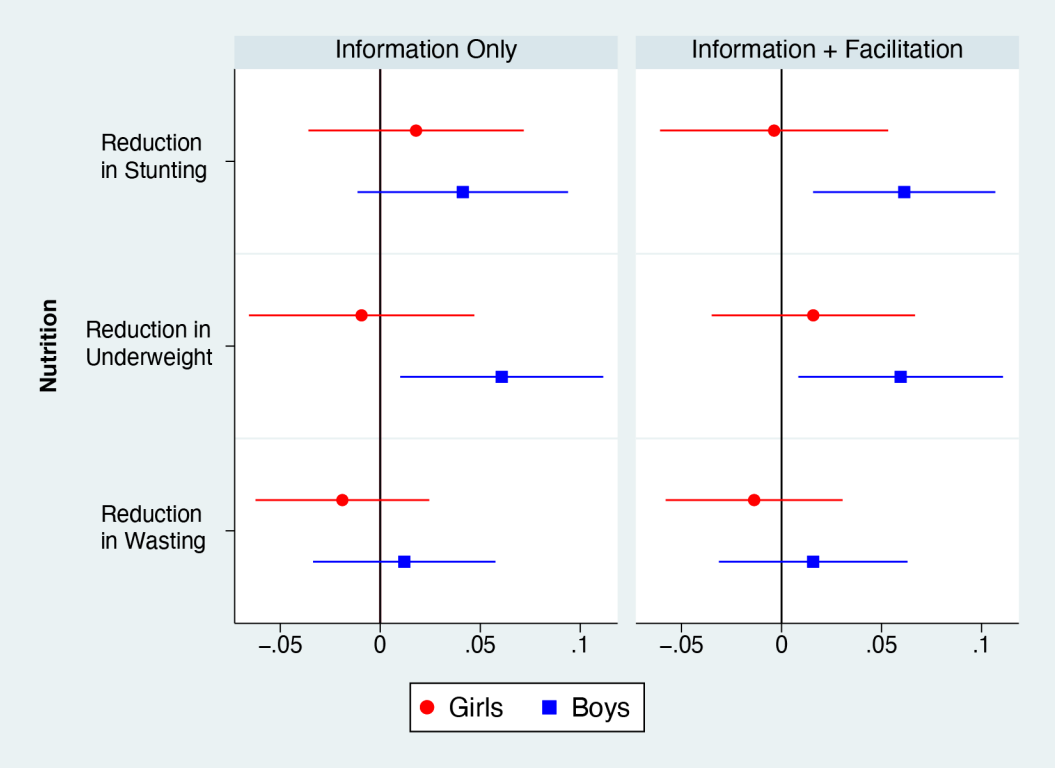


Figure 3.B. Effects of Accountability Interventions on Immunization, Treatment of Diarrhea, and Institutional Delivery, by gender.

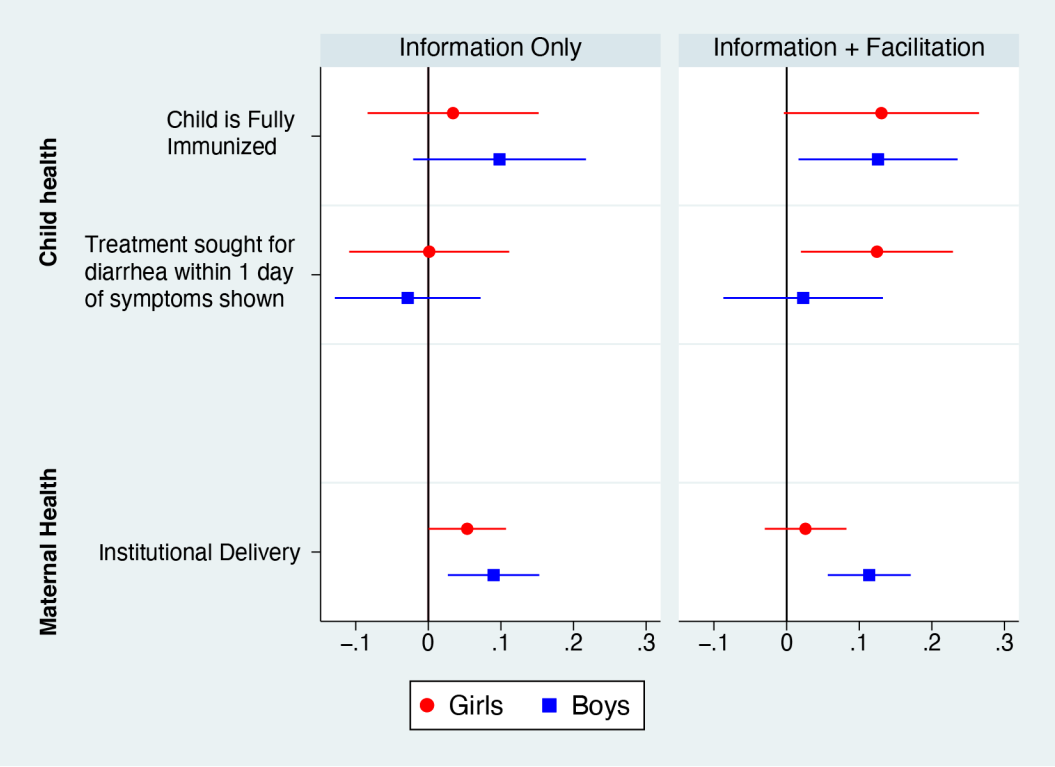


Figure 4.A. Effects of Accountability Interventions on Stunting, Underweight, and Wasting, by caste.

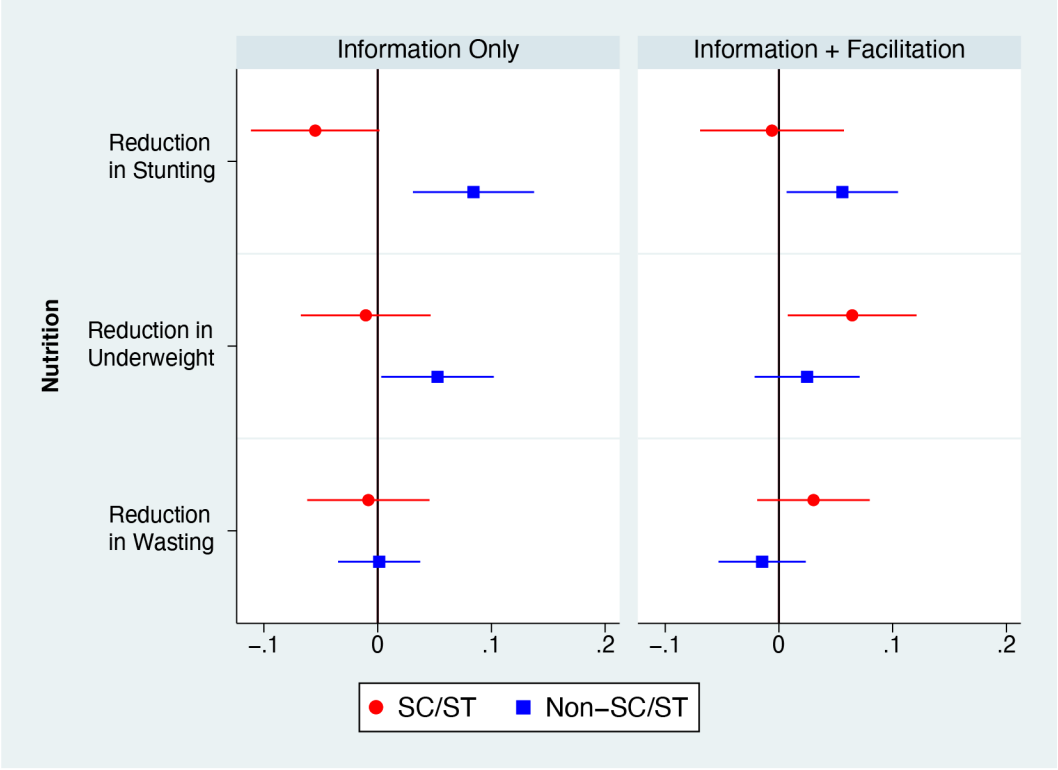


Figure 4.B. Effects of Accountability Interventions on Immunization, Diarrhea Treatment, and Institutional Delivery, by caste.

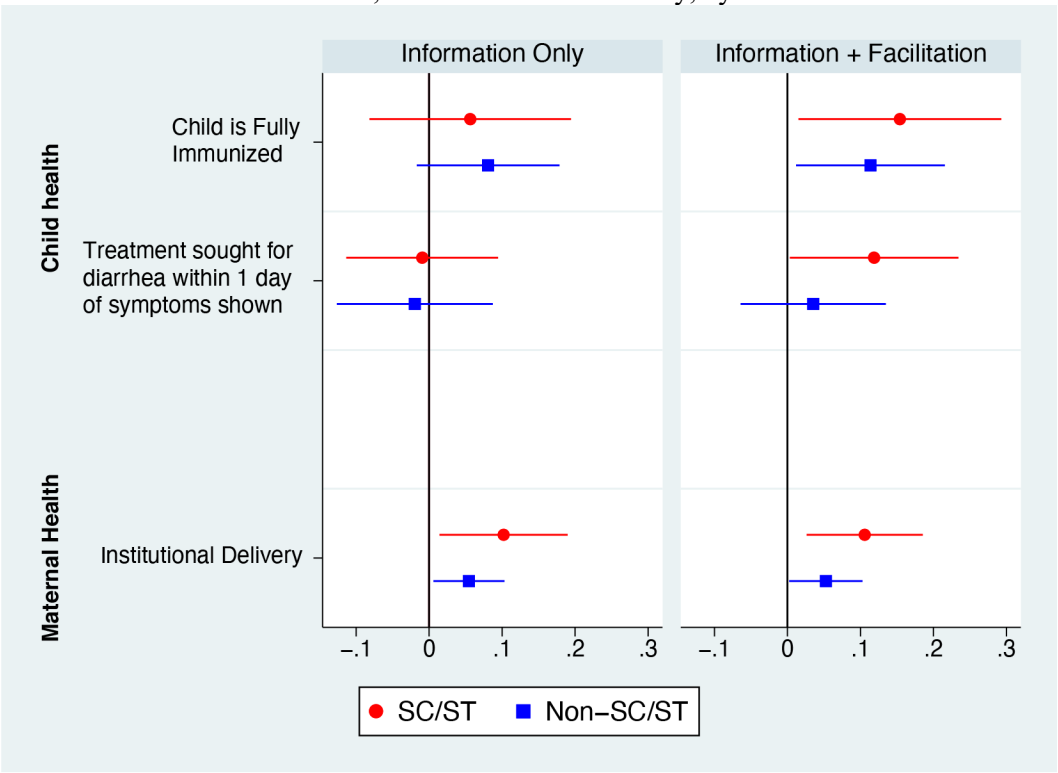


Table 1: Balance Across Treatment Arms

	Information only	Information + Facilitation	Control	p-value
Percent of households who are SC/ST	0.451	0.449	0.433	0.657
Percent of households who are Hindu	0.873	0.871	0.883	0.670
Wealthscore Index	-0.416	-0.672	-0.685	0.002
Percent of children who are male	0.519	0.531	0.517	0.778
Education level of mother (# of years)	1.848	1.738	1.744	0.172
Percent of children who are stunted (low height for age)	0.469	0.483	0.486	0.743
Percent of children who are wasted (low weight for height)	0.215	0.213	0.193	0.447
Percent of children who are underweight (low weight for age)	0.324	0.347	0.333	0.578
N	1,033	1,022	1,035	

Note: P-values in the final column are associated with F-tests of joint equality across the three study arms.

Table 2. Effect of Accountability Interventions on Stunting, Underweight, and Wasting for Children Under 5.

	Child is stunted		Child is underweight		Child is wasted	
	(1)	(2)	(3)	(4)	(5)	(6)
Information Only	-0.035	-0.030	-0.032	-0.028	0.001	0.001
	(0.022)	(0.021)	(0.019)	(0.018)	(0.016)	(0.016)
Information + Facilitation	-0.032	-0.031	-0.040^	-0.039^	-0.003	-0.003
	(0.021)	(0.020)	(0.018)	(0.018)	(0.016)	(0.016)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	4944	4939	5079	5074	4979	4974
Control Mean	0.525	0.525	0.494	0.494	0.252	0.252
R-squared	0.014	0.041	0.013	0.029	0.016	0.024

Notes: Coefficients from probit regressions; SEs clustered at village-level. Stunting is defined as height for age Z score 2 standard deviations less than the WHO median. Underweight is weight for age Z score that is < 2 SD, and Wasting is weight for height Z score that is < 2SD. All regressions include district and matched-trio fixed effects. Each even-numbered column includes the full set of household and child level controls: child's age and gender, religion and caste of the household, mother's age and education status, and number of children in the household. The table also indicates family wise p-values adjusted for multiple hypotheses using the free stepdown resample method.

^ Although statistically significant at conventional levels, the family-wise p-values that adjust for multiple hypotheses were not significant.

Table 3. Effect of Accountability Interventions on Mortality of Children Under 5

	Total deaths in the household in past 5 yrs		HH had any death in past 5 years		Deaths to births ratio at HH level	
	(1)	(2)	(3)	(4)	(5)	(6)
Information Only	0.003	-0.001	0.002	-0.002	0.001	0.001
	(0.008)	(0.001)	(0.007)	(0.001)	(0.003)	(0.003)
Information + Facilitation	0.002	-0.001	0.004	0.000	0.001	0.001
	(0.007)	(0.001)	(0.007)	(0.001)	(0.003)	(0.003)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child level controls		x		x		x
Observations	3766	3763	3927	3924	3766	3763
Control Mean	0.043	0.043	0.041	0.041	0.019	0.019
R-squared	0.011	0.983	0.010	0.955	0.011	0.015

Notes: Marginal effects from probit regressions; SEs clustered at village-level. 'Total deaths in the household in past 5 years' is definted by the respondent reporting the number of deaths in the previous 5 years of children under the age of 5. 'Household had any death in past 5 years' is defined by the respondent reported whether there was any death of a child under the age of 5 in the previous 5 years. 'Deaths to births ratio at household level' was computed by calculating the number of deaths to the number of births in the previous 1 year in the household. All regressions include district and matched-trio fixed effects. Even numbered columns include the full set of household and child level controls: child's age and gender, religion and caste of the household, mother's age and education status, and number of children in the household. The table indicates family wise p-values adjusted for multiple hypotheses using the free stepdown resample method.

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 4. Effect of Social Accountability Interventions on Immunization of Children Aged 12-23 Months

	Full Vaccination		Full DPT		Full Polio		Measles		BCG	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Information Only	0.088*	0.068	0.135***	0.122***	0.061	0.044	0.020	0.009	0.013	0.013
	(0.044)	(0.044)	(0.030)	(0.029)	(0.043)	(0.043)	(0.026)	(0.024)	(0.014)	(0.013)
Information + Facilitation	0.134**	0.127**	0.132***	0.116**	0.111**	0.103*	0.020	0.015	-0.009	-0.010
	(0.044)	(0.044)	(0.031)	(0.031)	(0.041)	(0.041)	(0.027)	(0.024)	(0.016)	(0.015)
Matched Trio Fixed Effects	x	x	x	x	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x	x	x	x	x
Household and Child Level Controls		x		x		x		x		x
Observations	1079	1073	1079	1073	1079	1073	1063	1057	1063	1057
Control Mean	0.439	0.439	0.739	0.739	0.519	0.519	0.895	0.895	0.963	0.963
R-squared	0.063	0.076	0.072	0.102	0.075	0.086	0.003	0.032	0.020	0.060

Notes: Coefficients from probit regressions; SEs clustered at village-level. The sample is restricted to children aged 12-23 months as per NFHS standards. Fully immunized is defined as having received immunization for BCG, measles, and 3 doses each for Polio and DPT. Full DPT is defined as having received three doses of DPT vaccine. Full Polio is defined as having received 3 doses of Polio (OPV) vaccine. Measles is a binary variable defined as having received measles immunization. BCG is a binary variable defined as having received BCG immunization. All regressions include district and matched-trio fixed effects. The even numbered columns include the full set of household and child level controls: child's age and gender religion and caste of the household mother's age and education status and number of children in the household. The table indicates family wise p-values adjusted for multiple hypotheses using the free stepdown resample method. Due to low variation in Measles and BCG variables within matched trios, we had to remove the matched trio fixed effects.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 5. Effect of Accountability Interventions on Presence of Diarrhea Symptoms, Time to Treat, and Duration of Symptoms for Children Under 5.

	Childhood diarrhea in previous 2 weeks		Sought diarrhea treatment within 1 day		Duration of diarrhea symptoms	
	(1)	(2)	(3)	(4)	(5)	(6)
Information Only	0	0.002	-0.012	-0.008	0.244	0.197
	(0.02)	(0.02)	(0.04)	(0.04)	(0.26)	(0.24)
Information + Facilitation	0.001	0.007	0.083	0.084	-0.154	-0.122
	(0.02)	(0.02)	(0.05)	(0.04)	(0.23)	(0.23)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	5085	5071	698	695	604	604
Control Mean	0.150	0.150	0.238	0.238	4.920	4.920
R-squared	0.058	0.075	0.15	0.158	0.123	0.159

Notes: Coefficients from probit (1-4) and OLS (5-6) regressions; SEs clustered at village-level. 'Treatment sought within 1 day' is defined as the household reporting that they either treated diarrhea at home or sought treatment from a health worker/facility within 1 day of symptoms. All regressions include district and matched-trio fixed effects. Each column includes the full set of household and child level controls: child's age, religion and caste of the household, mother's age and education status, and number of children in the household.

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 6. Effect of Accountability Interventions on Antenatal Care (ANC) Visits During Pregnancy and Institutional Delivery, Restricted to Births within Previous 24 Months.

	Went to at least 4 ANC visits		Number of ANC visits		Institutional delivery	
	(1)	(2)	(3)	(4)	(5)	(6)
Information Only	-0.003	-0.004	0.004	-0.001	0.080**	0.065**
	(0.02)	(0.02)	(0.06)	(0.06)	(0.02)	(0.02)
Information + Facilitation	0.019	0.022	0.088	0.092	0.076**	0.068**
	(0.02)	(0.02)	(0.06)	(0.06)	(0.02)	(0.02)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	1642	1635	1916	1909	2021	2013
Control Mean	0.064	0.064	2.224	2.224	0.806	0.806
R-squared	0.081	0.088	0.099	0.103	0.074	0.145

Notes: Coefficients reflect marginal effects from probit regressions (1-2 & 5-6) and OLS regressions (3-4); SEs clustered at village-level. 'At least 4 ANC visits' is defined by the respondents who report going to 4 or more antenatal care (ANC) visits during their pregnancy. 'Number of ANC visits' is defined by the total number of ANC visits reported by the respondent. 'Institutional delivery' is defined by respondents reporting that their birth took place in either a public or private medical center (and includes: government/municipal hospital, government dispensary, public health center, sub-center, NGO/Trust hospital or clinic, private hospital or maternity home/clinic, or other public or private sector health facility). All regressions include district and matched-trio fixed effects. The even numbered columns include the full set of household and child level controls: child's age and gender, religion and caste of the household, mother's age and education status, and number of children in the household. The table indicates family wise p-values adjusted for multiple hypotheses using the free stepdown resample method.

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 7. Effect of Accountability Interventions on Satisfaction with Frontline Health Workers (ASHA, ANM, and AWW).

	Average level of satisfaction with ASHA		Average level of satisfaction with ANM		Average level of satisfaction with AWW	
	(1)	(2)	(3)	(4)	(5)	(6)
Information Only	-0.041	-0.030	-0.066*	-0.063*	-0.079**	-0.085**
	(0.027)	(0.026)	(0.032)	(0.032)	(0.034)	(0.035)
Information + Facilitation	-0.011	-0.008	-0.024	-0.024	-0.044	-0.050
	(0.029)	(0.028)	(0.036)	(0.036)	(0.038)	(0.038)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	4216	4213	4216	4213	4216	4213
Control Mean	4.085	4.085	4.016	4.016	3.906	3.906
R-squared	0.332	0.343	0.248	0.253	0.189	0.199

Notes: Coefficients from OLS regressions; SEs clustered at village-level. Satisfaction indexes were created by averaging the household's reported satisfaction score (1-5) on a series of questions regarding their last interaction with the health worker (ASHA, ANM, and AWW). All regressions include district and matched-trio fixed effects. Each column includes the full set of household and child level controls: child's age, religion and caste of the household, mother's age and education status, and number of children in the household.

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

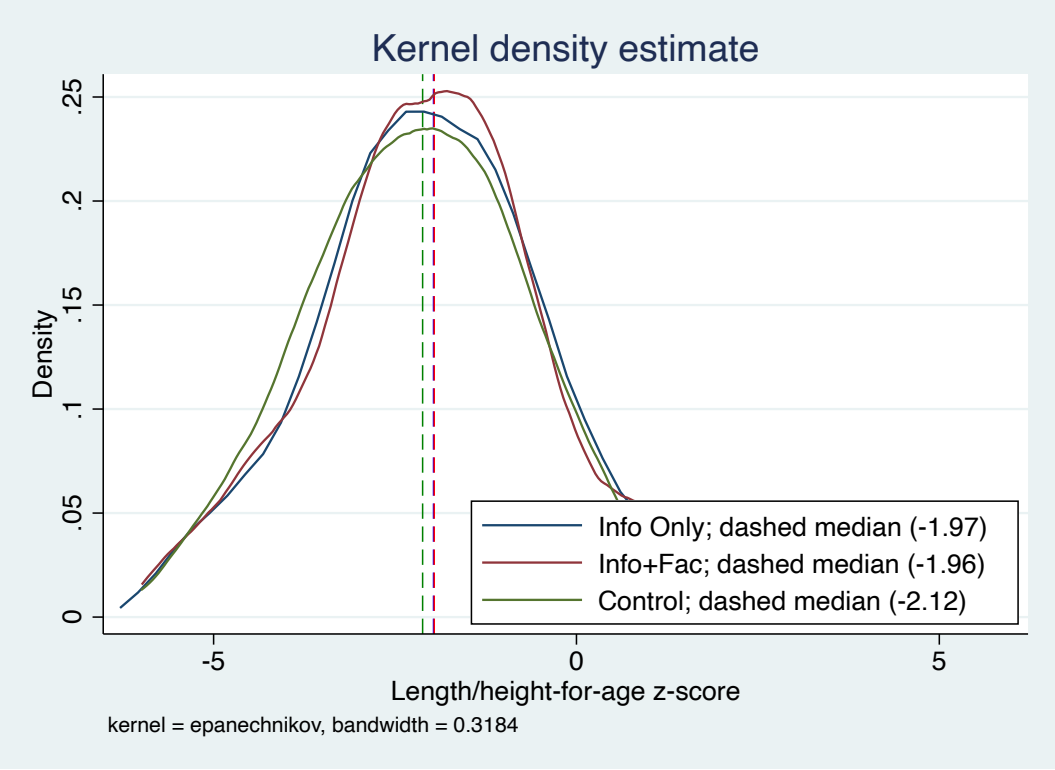
Table 8. Effect of Accountability Interventions on births in previous year

	Any birth in past 1 year		Conditional on birth in past 1 year, child is alive	
	(1)	(2)	(3)	(4)
Information Only	-0.049**	-0.047**	0.003	0.003
	(0.016)	(0.016)	(0.002)	(0.002)
Information + Facilitation	-0.058**	-0.056**	0.002	0.002
	(0.016)	(0.016)	(0.002)	(0.002)
District Fixed Effects	x	x	x	x
Household level controls		x		x
Observations	13327	13003	4135	4014
Control Mean	0.348	0.348	0.995	0.995
R-squared	0.006	0.010	0.014	0.019

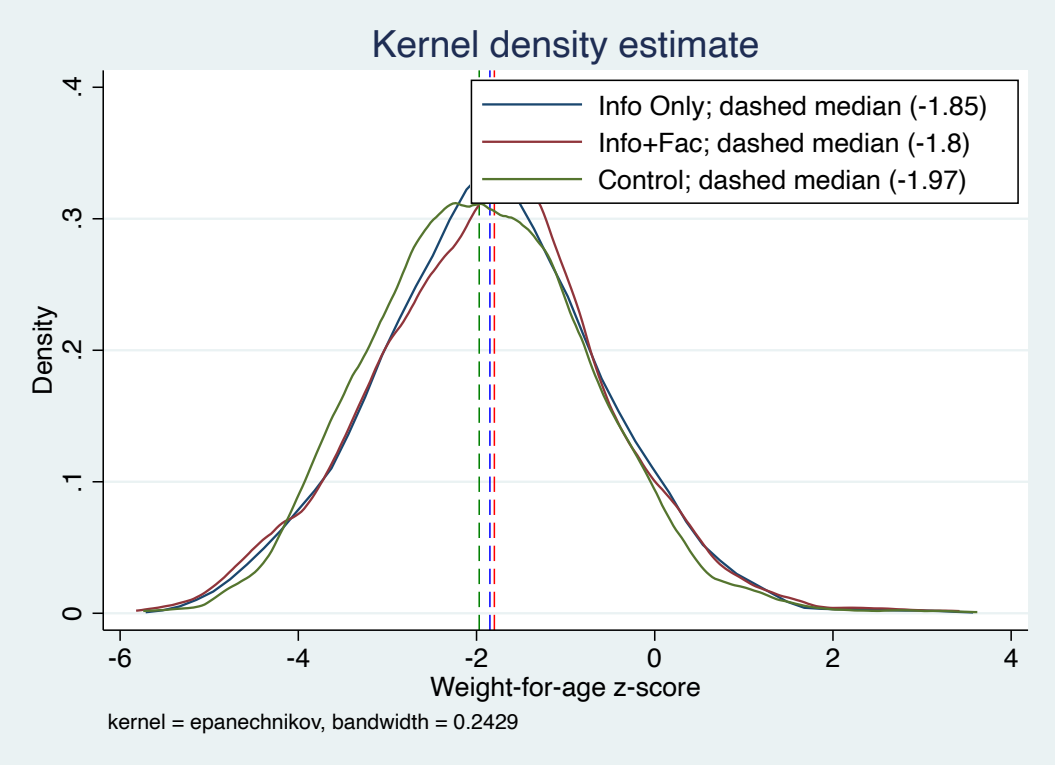
Notes: Marginal effects from probit regressions; SEs clustered at village-level. 'Births in past 1 year' is defined by the household reporting any births within one year prior to being survey. 'Child is alive' is defined by households who reported a birth in the previous year, and the child was still alive at time of survey. All regressions include district and matched-trio fixed effects. The even numbered columns include a set of household-level controls: religion and caste of the household, and number of household members.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Appendix Figures and Tables

Appendix Figure 1A. Distribution of Z-scores of Length/Height-for-age, by arm.



Appendix Figure 1B. Distribution of Z-scores of Weight-for-age, by arm.



Appendix Table 1. Effect of Accountability Interventions on Z-scores for Children Under 5.

	Length/height-for-age z-score		Weight-for-age z-score		Weight-for-length/height z-score	
	(1)	(2)	(3)	(4)	(5)	(6)
Information Only	0.125	0.113	0.083	0.072	-0.019	-0.017
	(0.082)	(0.078)	(0.055)	(0.052)	(0.073)	(0.072)
Information + Facilitation	0.129	0.141	0.074	0.077	-0.029	-0.015
	(0.080)	(0.076)	(0.055)	(0.051)	(0.072)	(0.072)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	4944	4939	5079	5074	4969	4964
Control Mean	-1.952	-1.952	-1.877	-1.877	-0.945	-0.945
R-squared	0.021	0.069	0.016	0.051	0.017	0.027

Notes: Coefficients from OLS regressions; SEs clustered at village-level. All regressions include district and matched-trio fixed effects. Each even-numbered column includes the full set of household and child level controls: child's age and gender, religion and caste of the household, mother's age and education status, and number of children in the household.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Appendix Table 2. Summary statistics from provider surveys on deliveries, contraception, and ante-natal care

	Information Only	Information + Facilitation	Control
Number of Sub-Center Deliveries in Past 3 Months	4.04	4.07	15.93
Number of Home Deliveries Attended by ANM in Past 3 Months	5.88	4.30	11.74
Contraceptives Given in Past 3 Months	11.92	13.82	11.56
Number of IFA Tables Given in Past 3 Months	28.92	23.22	28.00
Number of ANC Registrations in Past 3 Months	29.12	26.48	23.19

Notes: Data from interviews with providers.

Appendix Table 3: Simulations to test if missing data can explain differences in birth rates

	Information Only	Information plus Facilitation	Control
Panel A: Observed number of births and deaths in data			
HH w No births in past 1 year	3231	2982	2919
Births observed in past 1 year	1403	1231	1561
Observed % HH that had birth	30.3%	29.2%	34.8%
Panel B: Simulation: Implied IMR if all arms had same birth rates, and all infant deaths were systematically excluded only in treatment arms			
Number of births @ same % as Control	1728	1595	
Implied infant deaths IF births @ same % as Control	325	364	
Implied Infant Mortality Rate	188	228	
Panel C: Simulation: % of households that had births @ current IMR if all infant deaths were systematically excluded in treatment			
Estimated Infant Deaths (@IMR=.067)	101	88	
Total Births **IF** all infant deaths missed	1504	1319	
% HH that had birth (IF all infant deaths missed)	31.8%	30.7%	

Notes: In Panel B, we calculate number of infant deaths in each Treatment arm if the birth rate was same as Control, but those households were not included in the house listing in the treatment areas. In Panel C, we assume both treatment areas experience rates of Infant mortality that are same as that in rural UP in 2016, but all of those deaths were excluded in listing.

Appendix Table 4. Difference-in-Difference Estimation for Effect of Accountability Interventions on Stunting, Underweight, and Wasting for Children Under 5

	Child is stunted		Child is underweight		Child is wasted	
	(1)	(2)	(3)	(4)	(5)	(6)
Follow up # Information Only	-0.024	-0.027	-0.024	-0.024	-0.025	-0.026
	(0.042)	(0.041)	(0.033)	(0.033)	(0.033)	(0.032)
Follow up # Information + Facilitation	-0.020	-0.023	-0.050	-0.052*	-0.036	-0.037
	(0.038)	(0.038)	(0.027)	(0.026)	(0.029)	(0.029)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	7238	7149	7807	7706	7336	7243
Control Mean	0.400	0.400	0.336	0.336	0.179	0.179
R-squared	0.024	0.060	0.025	0.046	0.013	0.024

Notes: Coefficients from OLS regressions; SEs clustered at village-level. The models include a time period variable (indicating whether data was collected at baseline or follow-up), which is interacted with treatment variables "Information Only" and "Information + Facitilation". Stunting is defined as height for age Z score 2 standard deviations less than the WHO median. Underweight is weight for age Z score that is < 2 SD, and Wasting is weight for height Z score that is < 2SD. All regressions include district and matched-trio fixed effects. Odd numbered columns do not include household and child level controls. Even numbered columns include the full set of household and child level controls: child's age and gender, religion and caste of the household, mother's age and education status, and number of children in the household.
* p<0.05; ** p<0.01; *** p<0.001

Appendix Table 5. Difference-in-Difference Estimation for Effect of Accountability Interventions on Immunization for Children 12-23 months.

	Full Immunization		Full DPT		Full Polio		Measles		BCG	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Follow up	0.025	0.021	0.166**	0.162**	0.002	0.013	0.320***	0.314***	0.230***	0.223***
	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.04)	(0.04)
Information Only	-0.052	-0.062	-0.072	-0.078	-0.005	-0.006	-0.056	-0.062	-0.011	-0.023
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)
Information + Facilitation	-0.147**	-0.159**	-0.104	-0.105	-0.113	-0.112	-0.092	-0.094	-0.013	-0.018
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)
Follow up # Information Only	0.148	0.14	0.213**	0.201**	0.072	0.054	0.09	0.084	0.038	0.046
	(0.08)	(0.09)	(0.08)	(0.07)	(0.09)	(0.09)	(0.07)	(0.07)	(0.06)	(0.06)
Follow up # Information + Facilitation	0.284***	0.290***	0.230**	0.214**	0.226**	0.215**	0.115	0.114	0.007	0.008
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)	(0.06)	(0.06)
Matched Trio Fixed Effects	x	x	x	x	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x	x	x	x	x
Household and Child Level Controls		x		x		x		x		x
Observations	1741	1721	1741	1721	1741	1721	1725	1705	1725	1705
Control Mean	0.413	0.413	0.567	0.567	0.517	0.517	0.567	0.567	0.725	0.725
R-squared	0.082	0.096	0.164	0.184	0.076	0.088	0.25	0.265	0.201	0.219

Notes: Coefficients from probit regressions; SEs clustered at village-level. The models include a time period variable (indicating whether data was collected at baseline or follow-up), which is interacted with treatment variables "Information Only" and "Information + Facitilation". The sample is restricted to children aged 12-23 months as per NFHS standards. Fully immunized is defined as having received immunization for BCG, measles, and 3 doses each for Polio and DPT. Full DPT is defined as having received three doses of DPT vaccine. Full Polio is defined as having received 3 doses of Polio (OPV) vaccine. Measles is a binary variable defined as having received measles immunization. BCG is a binary variable defined as having received BCG immunization. All regressions include district and matched-trio fixed effects. The even numbered columns include the full set of household and child level controls: child's age and gender religion and caste of the household mother's age and education status and number of children in the household.

* p<0.05; ** p<0.01; *** p<0.001

Appendix Table 6. Difference-in-Difference Estimation for Effect of Accountability Interventions on Presence of Diarrhea Symptoms, Time to Treat, and Duration of Symptoms for Children Under 5.

	Childhood diarrhea in previous 2 weeks		Sought diarrhea treatment within 1 day		Duration of diarrhea symptoms	
	(1)	(2)	(3)	(4)	(5)	(6)
Follow up	0.023	0.013	-0.286***	-0.295***	-0.116	-0.173
	(0.022)	(0.022)	(0.076)	(0.070)	(0.388)	(0.402)
Information Only	-0.027	-0.027	0.046	0.042	-0.093	-0.322
	(0.022)	(0.022)	(0.077)	(0.077)	(0.543)	(0.525)
Information + Facilitation	0.000	0.000	0.038	0.034	-1.264*	-1.299*
	(0.020)	(0.021)	(0.098)	(0.095)	(0.500)	(0.506)
Follow up # Information Only	0.030	0.032	-0.045	-0.041	0.334	0.445
	(0.033)	(0.032)	(0.093)	(0.091)	(0.661)	(0.645)
Follow up # Information + Facilitation	0.001	0.005	0.054	0.052	1.134	1.171*
	(0.029)	(0.030)	(0.120)	(0.115)	(0.591)	(0.589)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	7965	7793	1084	1066	930	916
Control Mean	0.128	0.128	0.535	0.535	4.966	4.966
R-squared	0.044	0.058	0.185	0.201	0.098	0.127

Notes: Coefficients from probit OLS regressions; SEs clustered at village-level. The models include a time period variable (indicating whether data was collected at baseline or follow-up), which is interacted with treatment variables "Information Only" and "Information + Facitilation". 'Treatment sought within 1 day' is defined as the household reporting that they either treated diarrhea at home or sought treatment from a health worker/facility within 1 day of symptoms. All regressions include district and matched-trio fixed effects. Each column includes the full set of household and child level controls: child's age, religion and caste of the household, mother's age and education status, and number of children in the household.

* p<0.05; ** p<0.01; *** p<0.001

Appendix Table 7. Difference-in-Difference Estimation for Effect of Accountability Interventions on Antenatal Care (ANC) Visits During Pregnancy in Previous 24 Months.

	Went to at least 4 ANC visits		Number of ANC visits		Institutional delivery	
	(1)	(2)	(3)	(4)	(5)	(6)
Follow up	-0.063*	-0.064*	-0.562***	-0.545***	0.082*	0.098**
	(0.030)	(0.029)	(0.145)	(0.144)	(0.037)	(0.035)
Information Only	-0.001	-0.003	-0.197	-0.219	0.025	0.026
	(0.040)	(0.041)	(0.200)	(0.201)	(0.041)	(0.041)
Information + Facilitation	-0.042	-0.049	-0.235	-0.280	0.009	0.023
	(0.034)	(0.033)	(0.176)	(0.172)	(0.037)	(0.033)
Follow up # Information Only	0.004	0.005	0.217	0.234	0.058	0.047
	(0.046)	(0.046)	(0.229)	(0.232)	(0.047)	(0.047)
Follow up # Information + Facilitation	0.061	0.069	0.343	0.392*	0.070	0.054
	(0.043)	(0.042)	(0.202)	(0.197)	(0.046)	(0.044)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	3203	3161	2520	2506	3195	3153
Control Mean	0.123	0.123	2.768	2.768	0.716	0.716
R-squared	0.038	0.043	0.074	0.079	0.076	0.118

Notes: Coefficients from OLS regressions; SEs clustered at village-level. The models include a time period variable (indicating whether data was collected at baseline or follow-up), which is interacted with treatment variables "Information Only" and "Information + Facilitation". All regressions include district and matched-trio fixed effects. Even numbered columns include the full set of household and child level controls: child's age and gender, religion and caste of the household, mother's age and education status, and number of children in the household.
* p<0.05; ** p<0.01; *** p<0.001

Appendix Table 8. Difference-in-Difference Estimation for Effect of Accountability Interventions on Satisfaction with Frontline Health Workers

	Average level of satisfaction with ASHA		Average level of satisfaction with ANM		Average level of satisfaction with AWW	
	(1)	(2)	(3)	(4)	(5)	(6)
Follow up	0.360***	0.312***	0.516***	0.479***	0.552***	0.526***
	(0.086)	(0.082)	(0.081)	(0.081)	(0.085)	(0.086)
Information Only	-0.000	0.011	0.067	0.050	-0.001	-0.008
	(0.096)	(0.093)	(0.081)	(0.082)	(0.086)	(0.086)
Information + Facilitation	-0.099	-0.097	-0.036	-0.054	0.001	-0.008
	(0.093)	(0.091)	(0.076)	(0.076)	(0.084)	(0.085)
Follow up # Information Only	-0.035	-0.030	-0.128	-0.102	-0.074	-0.062
	(0.120)	(0.115)	(0.108)	(0.107)	(0.117)	(0.116)
Follow up # Information + Facilitation	0.100	0.102	0.021	0.042	-0.031	-0.019
	(0.114)	(0.110)	(0.104)	(0.104)	(0.116)	(0.116)
Matched Trio Fixed Effects	x	x	x	x	x	x
District Fixed Effects	x	x	x	x	x	x
Household and Child Level Controls		x		x		x
Observations	6799	6678	6714	6574	7001	6852
Control Mean	3.749	3.749	3.514	3.514	3.339	3.339
R-squared	0.237	0.253	0.252	0.259	0.212	0.215

Notes: Coefficients from OLS regressions; SEs clustered at village-level. The models include a time period variable (indicating whether data was collected at baseline or follow-up), which is interacted with treatment variables "Information Only" and "Information + Facitilation". Satisfaction indexes were created by averaging the household's reported satisfaction score (1-5) on a series of questions regarding their last interaction with the health worker (ASHA, ANM, and AWW). All regressions include district and matched-trio fixed effects. Even numbered columns include the full set of household and child level controls: child's age, religion and caste of the household, mother's age and education status, and number of children in the household.

* $p<0.05$; ** $p<0.01$; *** $p<0.001$